



THOUGHT  
LEADERSHIP  
**NMEA 2000**  
**PLUG AND PLAY**

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# The Plug and Play World of **NMEA 2000**



## What is NMEA?

In a marine environment, technology depends on proper function, and consistent communication achieved with established and standardized protocols set by the National Marine Electronic Association (NMEA). NMEA has provided two international standardized protocols. The first, NMEA 0183, was released in 1983 and is commonly found on boats dating from the mid-1980s to the present. To update this standard, NMEA released NMEA 2000 in 2001. The NMEA 2000 standard is based on a Controller Area Network ("CAN Bus"), designed to improve the efficiency and message protocols between different electronic devices. NMEA 2000 uses Parameter Group Numbers (PGNs) to enable and disable messages to multiple NMEA 2000 systems. These PGNs, in terms of GNSS, turn on positioning messages, attitude messages, heading messages, signal quality, and constellation information. In the previous NMEA 0183 protocol, these messages and commands were

represented by the American Standard Code for Information Interchange (ASCII) commands (Example: GPGGA, GPGLL, or GPZDA) to turn on the previously mentioned messages. These devices include the display, radar, and GNSS to name a few. In some circumstances, a NMEA gateway can be placed on older ships that still talk NMEA 0183. The NMEA gateway permits NMEA 0183 data to be converted to NMEA 2000 and allows older marine electronics to continue working with newer NMEA 2000 systems.







### How does NMEA 2000 work?

In a typical boat, a NMEA 2000 system would be in place. This system consists of a backbone, which is a main group of cables, and a T connectors system that runs the length of the boat. The backbone is powered by the battery connected to one of the T connectors and can consist of multiple cables with a minimum of three T connectors through more than 10 T connectors. These T connectors connect NMEA 2000 capable devices including the multi-function display, wind transducers, engine monitor, radar, speed transducers, depth transducers, and GNSS. Since all these devices are NMEA 2000 capable, they will talk using the same standard protocol to work together. Some small configurations may be required, but most devices will work without any configuration.

### Do I need to use the same brand?

In many circumstances, when you buy a specific brand, you feel the need to continue using the same brand for everything. You may assume that the branded product you currently have, will



support only products from the same brand. This is called brand loyalty, the feeling that you are required or urged to buy your products from the same store or manufacturer. Many times, brand loyalty comes at a higher price. Companies may rely on your brand loyalty and make product assumptions intended to pull you into their product offering, which allows them to charge you more for a product that supports fewer features or works less efficiently than the same product from a different company.

### How does NMEA 2000 help me?

Because of international standards like the NMEA 2000, you have the option to pick and choose the devices you want on your boat. Specifically, you are not obliged to use only a specific brand or product line throughout the same system. Now you have the freedom to shop for the best engine, multi-display, depth transducer, and GNSS system without limitations. NMEA 2000 lets you find the best fit for your boat and your needs. If you want high-accuracy GNSS systems for navigation, autopilot, or maintaining heading and position, you can pick a NMEA 2000-capable product and plug it into your existing NMEA 2000 backbone. This flexibility removes unnecessary pressure from marine manufacturers to buy their brand exclusively. Like a PC, which allows any USB-based keyboard or mouse to be plugged into and work, NMEA 2000 does the same thing for marine electronic devices.





### Product: V200

Experience superior navigation from the accurate heading and positioning performance available with the Vector™ V200 GNSS compass. The multi-GNSS Vector V200 supports GPS, GLONASS, BeiDou, Galileo, and QZSS and offers an astonishing worldwide 50 cm (RMS) accuracy via Hemisphere's Atlas GNSS global correction service. The Vector V200 offers an incredible combination of simple installation, small form factor, and amazing performance. The compass measuring only 35 cm in length - mounts easily to a flat surface or pole. The stability and maintenance-free design of the Vector V200 provide simple integration into autopilots, chart plotters, and AIS systems.

- L1 GPS, GLONASS, Galileo, BeiDou, QZSS
- 50 cm RMS worldwide positioning accuracy with Atlas corrections
- 0.75-degree heading accuracy in an amazingly small form factor
- Excellent in-band and out-of-band interference rejection
- Integrated gyro and tilt sensors help deliver fast start-up times and provide heading updates during temporary loss of satellites
- Provides heading, positioning, heave, roll, and pitch

### Product: VS1000

The Vector VS1000 is Hemisphere GNSS' premiere multi-GNSS, multi-frequency receiver designed specifically for the professional marine market. Providing precise heading, Athena RTK positioning, and full Atlas capability, its rugged design is compliant with IEC 60529:2013 IP67 and IEC 60945:2002 8.7 standards. The VS1000 supports antenna separations up to 10 meters, offering heading accuracy to 0.01 degrees RMS and RTK position accuracy with full support for Hemisphere GNSS' Atlas worldwide L-band corrections.

- Athena™ RTK and Atlas® L-band capable
- Extremely accurate heading (to 0.01° RMS)
- Multi-frequency GPS/GLONASS/BeiDou/Galileo
- Purpose-built for the most challenging environments
- Supports Ethernet, NMEA 2000, Serial, USB, Bluetooth, and Wi-Fi
- Powerful WebUI accessed via Wi-Fi plus a 128x64 display and 10 multi-color LEDs





## Conclusion

The NMEA 2000 standard opens the door to an infinite amount of marine device combinations. You have the power to build the boating system that works for you. Don't spend money and effort on a sub-par GNSS product based solely upon the brand name and the preconceived notion that only the same branded GNSS product will work with your marine system. With products like the V200 and VS1000 supporting the NMEA 2000 protocol, you can add versatility, advanced features, and better accuracy at a lower cost. Order a product that delivers what you need. Reach out to a local Hemisphere GNSS dealer or go to [HGNS.com](http://HGNS.com) for more information.





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